POST-OPERATIVE VOMITING IN RELATION TO ANAESTHETIC TIME

BY

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General anaesthesia is a temporary pathological state, but with the improvements in methods of administration of the last few decades there is a tendency for light general anaesthesia to be regarded as harmless. On the whole it may be true that no lasting harm accrues from prolonged anaesthesia, but it would appear, from observations made over a period of 18 months on the incidence of post-operative vomiting, that the duration of anaesthesia is a definite factor in the amount of constitutional upset and post-operative discomfort in the patient.

Adult Cases

The cases from which these figures have been drawn were largely (90%) patients undergoing plastic surgical procedures, mostly in the head and neck regions and requiring endotracheal anaesthesia. In a large number operations were performed in and around the mouth and nose, and a few of these patients inevitably swallowed small quantities of blood post-operatively. All the cases in this series had premedication by omnopon gr. 1/3 and scopolamine gr. 1/150 about an hour before operation. Atropine gr. 1/100 was substituted for scopolamine in patients over 50 years of age, and in occasional cases the dose of omnopon and scopolamine was reduced on account of debility or low body weight.

Anaesthesia was induced in every case by pentothal sodium and maintained by nitrous oxide and oxygen. If 75 to 80% nitrous oxide proved insufficient to maintain adequate anaesthesia, supplementary pentothal, ether, or cyclopropane was employed. A 2% amethocaine jelly was used as lubricant for the endotracheal tubes. Anaesthesia was confined to the first plane except in a few instances where bone or cartilage grafts were taken from the ilium or costal margin. Neither of these procedures, however, requires the depth of anaesthesia needed for relaxation in even a lower laparotomy.

No attempt was made to distinguish between degrees of vomiting, nor was nausea taken into account, conclusions being based on the presence or absence of actual vomiting. In some cases observations were complicated by sulphonamide therapy, and in these any vomiting which occurred later than 12 hours after operation was disregarded.

Duration of operation is divided, as conveniently set out in the perforated anaesthetic record cards introduced by Nosworthy (1943), into four classes: (1) less than 1/2 hour; (2) less than one hour; (3) less than two hours; (4) longer periods. Total cases showed a progressive rise in the incidence of vomiting with the duration of anaesthesia (Table I).

TABLE I.—Time in Hours

	Under 1/2	Under 1	Under 2	Over 2
Total cases ..	151	349	459	104
Vomited ..	41 (27%)	98 (28%)	199 (43%)	55 (53%)

Divided into sex groups (Table II) the incidence shows an even more marked progressive increase with the duration of anaesthesia; this table also demonstrates a considerable predominance of vomiting among women, as reported by Davies (1941).

TABLE II.—Sex Incidence

Hours:	Under 1/2		Under 1		Under 2		Over 2	
	Men	Women	Men	Women	Men	Women	Men	Women
Total cases ..	67	84	229	120	277	182	69	35
Vomited ..	8	33	34	64	84	115	22	33
Men ..	12%	—	15%	—	30%	—	32%	—
Women ..	—	38%	—	53%	—	63%	—	94%

In many cases no supplement to the nitrous oxide was required for maintenance; in the others so small a quantity of the additional agent was used that one would expect very little alteration in the figures for the different supplementary agents (Table III). This does not appear to be the case, but

the totals on which the percentages are based are perhaps too small to offer satisfactory evidence. They suggest, however, that both ether and, to a lesser extent, cyclopropane increase the incidence of vomiting. The variation with duration is still largely upheld.

TABLE III.—Vomiting with Use of Supplementary Agents

Hours:	Under 1/2		Under 1		Under 2		Over 2	
	Men	Women	Men	Women	Men	Women	Men	Women
<i>Pentothal, nitrous oxide, oxygen</i>								
Total cases ..	43	41	116	67	138	76	26	12
Vomited ..	6	11	15	30	31	45	8	11
Men ..	14%	—	14%	—	22%	—	31%	—
Women ..	—	27%	—	45%	—	59%	—	92%
<i>Pentothal, nitrous oxide, oxygen, cyclopropane</i>								
Total cases ..	5	6	33	16	46	27	17	20
Vomited ..	1	3	6	10	12	18	2	19
Men ..	20%	—	18%	—	26%	—	12%	—
Women ..	—	50%	—	62%	—	67%	—	95%
<i>Pentothal, nitrous oxide, oxygen, ether</i>								
Total cases ..	19	37	80	37	93	79	26	20
Vomited ..	1	19	13	24	41	52	12	19
Men ..	5%	—	15%	—	44%	—	46%	—
Women ..	—	51%	—	65%	—	66%	—	95%

It might be argued that the increase in vomiting with increase in duration of anaesthesia is due to the production of slight degrees of anoxia by surgical shock. This may very well be true; but, generally speaking, plastic operative procedures rarely cause any demonstrable degree of shock unless associated with considerable haemorrhage. Care was taken at all times to avoid anoxia, and an adjuvant agent was added or increased in preference to "pushing" the nitrous oxide. Where any factor predisposing to anoxia was suspected the oxygen percentage was increased considerably, and in certain cases, which do not appear in this series, nitrous oxide was omitted altogether.

Child Cases

A most striking contrast to the above is provided by a separate series of 230 endotracheal anaesthetics in children under 10 years of age. The operative procedures, in these cases also, required the lightest of anaesthesia. Premedication consisted of atropine, and children over 2 years of age were given oral seconal or rectal pentothal for basal narcosis. Anaesthesia was maintained with nitrous oxide, oxygen, and minimal ether, delivered to a short side-feed catheter-mount to which was connected a length of corrugated tubing, thus employing Ayres's "T"-tube principle. Vinesthene or cyclopropane was used in most cases to achieve a smooth and rapid induction to a depth desirable for intubation. A high proportion of these patients vomited in the theatre immediately on withdrawal of the anaesthetic, but the figures (Table IV) are based on whether they vomited or not after return to the ward.

Judged on the numbers available, the incidence of vomiting in children does not appear to be significantly altered by the duration of anaesthesia within the range of the periods studied.

TABLE IV.—Vomiting in Children

Hours:	Under 1/2	Under 1	Under 2	Over 2
Total cases ..	10	61	143	20
Vomited ..	2 (20%)	22 (36%)	35 (25%)	6 (30%)

These observations immediately suggest a psychological factor in adult vomiting, but it is difficult to conceive how this can be correlated with the duration of operation. The patient cannot know, unless told, how long the operation lasted, and in plastic surgery cases the amount of after-pain would be a most deceptive guide to the length of anaesthesia.

Summary

A series of over 1,000 cases is examined, and evidence is presented which strongly suggests that the incidence of vomiting after light anaesthesia is materially affected by the duration of anaesthesia in adults, but that this does not appear to be true in children.

I should like to express my thanks to the Director-General of the Ministry of Pensions for allowing this publication; and to Prof. Kilner, Director of the Plastic Surgery Unit, for continual encouragement and advice.

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